

## Office of Space Commercialization

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**HEADLINE:** **Boeing Begins Production Of Advanced GPS**

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**BODY:**

Boeing Integrated Defense Systems has received approval from the Air Force to begin space vehicle production of the first three satellites for the Navstar **GPS** Block IIF system (NAVigation Satellite Timing and Ranging **Global Positioning** Satellite Block IIF), all of which will be built by Boeing Satellite Systems in El Segundo, Calif.

The new **GPS** Block IIF satellites are being built to replace existing 28 **GPS** Block I, II, and IIA satellites currently in orbit. The **GPS** constellation provides navigation data to military and civilian users all over the world.

"The Boeing **GPS** IIF will ensure the nation has the capabilities to support the infrastructure for Homeland Security and National Defense, as well as improve the system's capabilities for all **GPS** users," said Mike Rizzo, director of navigation systems for Air Force Systems, part of Boeing Integrated Defense Systems, a business unit of Boeing. "The **GPS** satellites are also elements of the integrated battlespace, a network-based information system that takes data from many sources and ties it together to provide real-time information." The **GPS** IIF satellites will provide new capabilities, including new signals for civilian users and critical, secure operational military codes for the warfighter. A new civilian signal, in the protected aeronautical radio navigation system frequency band, provides redundant safety of life services for civil aviation users and increased accuracy for a host of other users worldwide.

In addition, **GPS** IIF is compatible with the Air Force's Expendable Launch Vehicle (EELV) and will provide 20 percent more on-orbit life than previous **GPS** spacecraft. The Air Force has chosen the Boeing Delta IV to launch 21 of its 28 EELV payloads. The Delta IV is scheduled to make its maiden flight on Nov. 16 carrying a commercial communications satellite for Eutelsat of Europe.

The next launch of the current **GPS** IIR models aboard a Delta II scheduled for Nov. 7, has been delayed after an accident during the hoisting of the payload and the Delta's third stage at Cape Canaveral Air Force Station, Fla., complex 17.

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Designed for flexibility and growth, the new **GPS** IIF system architecture can affordably accommodate hardware and software changes through incremental technology upgrades to improve efficiency and introduce new military capabilities including anti-jam, greater accuracy, better availability and higher integrity. This incremental upgrade approach to the **GPS** IIF program will, in turn, reduce the technical risks inherent in developing **GPS** III, the next generation satellite system, as well as answer the near term needs of the warfighter today. But improvements are still needed in future **GPS** systems.

In January, the Office of Naval Research (ONR), Arlington, Va., was seeking proposals on efforts to develop and demonstrate technologies for the next generation concepts, devices, and systems in navigation and timekeeping.

"Unfortunately, the **GPS** signal is a low-power signal that is susceptible to interference. Therefore there is a need for affordable approaches to make **GPS** more reliable/robust alternatives," the ONR said in their proposal announcement.

ONR has conducted a series of science and technology projects in **GPS** anti-jam technology over the past two years, the agency said.

Following the ONR announcement, the Defense Department (DOD) announced in May, plans to increase, by a factor of eight, the military signal power on its **GPS** satellites by 2006 in a program funded initially with \$200 million. The high power signal will enable the satellites to be less susceptible to jamming, DOD said.

The Boeing-led Control Segment team, that includes Lockheed Martin and Harris Corporation, will also play a key role in the modernization of the entire **GPS** ground system architecture design to reduce operator workload and operational costs.

Russia and China are the only other countries that have their own satellite navigation systems in orbit. Europe continues to push for development of their own system called Galileo.

Today Russia operates a partial constellation of navigation satellites named GLONASS (Global Navigation Satellite System). Just like the U.S. **GPS** system, the GLONASS system requires 24 operational satellite in orbit to provide full global coverage for users. Today only seven satellites are providing service.

Russia plans to restore its constellation of 24 GLONASS navigation satellites by 2004, with further Proton K launches of spacecraft starting in December. Three satellites were launched on Dec. 1, 2001 and there are plans to launch two to three Protons each year with either two or three satellites on board.

The European Space Agency is planning to launch its first test Galileo navigation satellite in 2004.